CLAIMS

1 A method of wireless transmission of data in digital and/or analogue format through a communications channel (72) from at least two local data sensors (14, 16) to a data processing means (24), said method comprising the step of division of said channel into sub-channels and transmitting said data from said data sensors respectively through said sub-channels accordingly;

characterised by

a) said step of division of said communications channel being effected asymmetrically whereby the data carrying capacities of said sub-channels are unequal; and

b) the data rate required for data transmission from said local sensors differing substantially between said at least two sensors; and

c) allocating data from said local data sensors to respective ones or groups of said sub-channels [being effected] in accordance with the data carrying capacities of said sub-channels.

2 A method according to claim 1 characterised by said step of division being effected on a frequency basis.

3 A method according to claim 1 characterised by said step of division being effected on a time-division basis.

4 A method according to any one of claims 1 to 3 characterised by said step of division being adapted to effect said division on an interdigitated non-chopping data-allocation basis in which a degree of data element transmission time overlap between channels is permitted.

5 A method according to claim 1 characterised by said step of division being effected by packet-switching of data from said local data sensors, and interleaving said data packet with an unsymmetrical packet distribution.

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6 A method according to any one of claims 1 to 5 characterised by said data processing means comprising a host PC (24) having a series of virtual serial ports, and said method comprising allocating each of said sub-channels to a corresponding one of said virtual serial ports.

7 A method according to any one of claims 1 to 6 characterised by said local sensors comprising automotive diagnostic and/or servicing sensors and said wireless transmission of data being effected at radio frequencies.

8 A method according to any one of claims 1 to 7 characterised by at least one of said local sensors (14) also providing a primary data-processing function.

9 A method according to any one of claims 1 to 8 characterised by said local sensors comprising vibration sensor means (104) adapted to sense machine vibration, and said method comprising transmitting said data therefrom.

10 A method according to claim 9 characterised by the step of using as said sensors, sensors (104) adapted to provide vibration data permitting noise vibration harshness (NVH) analysis of the data.

11 A method according to claim 10 characterised by at least three of said sensors being such NVH sensors, and the method comprising employing said sensors at three-dimensionally spaced locations to identify the location or co-ordinates of a source of vibration.

12 A method according to claim 9 or claim 10 characterised by said vibration sensor means further comprising three-dimensional location sensing means (106) and the method comprising the step of using said sensor to sense vibrations at three dimensionally-spaced locations in

sequence, and using said three-dimensional location sensing means to identify the location or co-ordinates of said three spaced locations so as to identify the location or co-ordinates of a source of vibration.

13 Apparatus for wireless transmission of data in digital and/or analogue format through a communications channel (12) from at least two local data sensors (14, 16) to a data processing means (24), the apparatus comprising a multiplexer (62) adapted to effect division of said communications channel into sub-channels, and a transmitter (34) adapted to transmit said data through said sub-channels accordingly;

characterised by

a) said multiplexer being adapted to divide said communications channel asymmetrically whereby the data carrying capacities of said sub-channels are unequal; and

b) control means (40) adapted to allocate data from said local data sensors to respective ones or groups of said communications sub-channels in accordance with substantially different data rate requirements from said local sensors.

14 Apparatus according to claim 13 characterised by said multiplexer being adapted to effect said multiplexing on a frequency basis.

15 Apparatus according to claim 13 characterised by said multiplexer being adapted to effect said multiplexing on a time-division basis.

16 Apparatus according to any one of claims 13 to 15 characterised by said multiplexer being adapted to effect said multiplexing on an interdigitated non-chopping data-allocation basis in which a degree of data element transmission time-overlap between channels is permitted.

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17 Apparatus according to claim 13 characterised by said multiplexer being adapted to effect packet-switching of data from said local sources and to interleave said data packets with an unsymmetrical packet distribution.

18 Apparatus according to any one of claims 13 to 17 characterised by said data processing function comprising a host PC (24) having a series of virtual serial ports, and said control means being adapted to allocate each of said sub-channels to a respective one of said virtual ports.

19 Apparatus according to any one of claims 13 to 18 characterised by at least one of said local sensors (14) being adapted to provide a primary data-processing function.

20 Apparatus according to claim 19 characterised by said local sensors comprising vibration sensor means (104) adapted to sense machine vibration whereby said apparatus can transmit said vibration data from said vibration sensing means.

21 Apparatus according to claim 20 characterised by said local data sensors comprising sensors adapted to provide vibration data permitting noise vibration harshness (NVH) data for analysis thereof.

22 Apparatus according to claim 21 characterised by said local data sensors comprising at least three or more such NVH sensors whereby said sensors can be located at three-dimensionally spaced locations to provide data enabling identification of the location or co-ordinates of the source of a vibration in a machine.

23 Apparatus according to claim 20 or claim 21 characterised by said vibration sensor means further comprising three-dimensional location sensing means (106)

whereby said vibration sensor means can sense vibrations at three-dimensionally-spaced locations in sequence and said three-dimensional location sensing means can identify the co-ordinates or locations of said three locations so as to enable identification of the location or co-ordinates of a source of vibration.

24 A method for vibration analysis of a machine or other article comprising:

a) providing a vibration sensor (104);

b) causing said sensor to sense vibrations;

c) analysing signals produced by said sensor;

characterised by

d) providing said sensor with three-dimensional location sensing means (106);

e) causing said vibration sensor to be mechanically coupled to the machine or other article to sense vibrations at three-dimensionally-spaced locations and using said three-dimensional location sensing means to determine the co-ordinates of said three locations; and

f) identifying the location or co-ordinates of a source of vibration accordingly.

25 Apparatus for vibration analysis of a machine or other article comprising:

a) a vibration sensor (104) adapted to sense vibrations at chosen locations; and

b) analysis means (124) adapted to analyse signals produced by said sensor;

characterised by

c) said vibration sensor being adapted to be mechanically coupled to the machine or other article and further comprising three-dimensional location sensing means (106);

d) whereby said single sensor can be caused to sense vibrations at three-dimensionally spaced locations at which said three-dimensional location sensing means can identify

the co-ordinate locations thereof whereby the corresponding co-ordinates of a source of vibration can be determined.